71

CORRELATION BETWEEN ISOMETRIC MUSCLE STRENGTH AND THE UPPER QUARTER Y BALANCE TEST PERFORMANCE IN SWIMMING ATHLETES

Gabriel Alves Dos Santos, Danyelle Leite Furtado de Araújo, Matheus Lemos Dos Santos, Bruna Gabriella Nascimento Bezerra, Marlison Douglas Nascimento Silva, Mayara Ribeiro Da Silva, Valéria Mayaly Alves de Oliveira, Danilo Harudy Kamonseki
Departamento de Fisioterapia, Universidade Federal da Paraíba (UFPB), João Pessoa, PB, Brazil

Background: Functional tests are commonly used in sports injury rehabilitation and prevention to measure abilities associated with athletic demands, including muscle strength, power, and agility. The Upper Quarter Y Balance Test (UQYBT) is commonly used for assessment of upper limb physical performance of the athletes. However, the association of the UQYBT and isometric muscle strength of kinetic chain muscles is not yet fully understood in swimming athletes. Therefore, further studies are needed to investigate the relationship between muscle strength and the UQYBT in this population.
Objectives: To evaluate the correlation between isometric muscle strength of the kinetic chain muscles and the scores of UQYBT in swimming athletes.
Methods: This is a cross-sectional study. This study was approved by Ethics Research Committee. Swimmers of both sexes, aged between 12 and 60 years, with at least one year of competitive swimming experience and a training regimen of at least twice a week, were included. The UQYBT was analyzed in its medial, superolateral, and inferolateral directions. The athletes placed one hand at the center of the lines, and the other hand moved the free limb as far as possible three times in each direction. The mean, normalized by upper limb length, and the composite score were considered for analysis. Peak (Kg) of isometric muscle strength was assessed for shoulder elevators (scapion), shoulder rotators, lower trapezius, serratus anterior, trunk extensors and flexors, hip extensors, abductors, and internal and external rotators, as well as knee extensors. Pearson's correlation coefficient was considered as = 0.25 no relationship; 0.25 to .050 weak; 0.50 to 0.75 moderate, = 0.75 strong. Data analysis was performed using the Statistical Package for the Social Sciences, version 23.0 (SPSS Inc, Chicago, IL).
Results: A total of 51 athletes participated in the study. The medial direction of the UQYBT was significantly weakly correlated with muscle strength of all assessed muscles groups (r ranging from 0.30 to 0.46), except with trunk flexors (r = 0.26) and internal rotators (r = 0.27), which showed non-significant weak correlation. The inferolateral directions of UQYBT showed positive moderate correlation with trunk flexors (r = 0.59), knee extensor (r = 0.55), and lower trapezius (r = 50), and significant weak correlation with all other muscles groups (r ranging from 0.36 to 0.43). The composite score was weakly correlated with all isometric muscles strength ($r < 0.03$, $p > 0.05$). The superolateral direction showed no relationship with the strength of all the muscle groups analyzed (r ranging from 0.05 to 0.24).
Conclusion: The findings indicated that performance in the medial direction of the UQYBT was weakly correlated with all the muscles analyzed, the inferolateral direction was moderalty correlated with knee extensor, trunk flexors, and lower trapezius strength, and the superolateral direction was weakly correlated with all the muscles analyzed.
Implications: These results can support clinicians in making informed decisions regarding the application of the UQYBT and in identifying which components of the kinetic chain may influence test performance. Consequently, strengthening key muscle groups may help improve UQYBT scores.
Keywords: Physical Performance Test, Functional Test, Kinetic Chain

Conflict of interest: The authors declare no conflict of interest.
Funding: Empresa Brasileira de Serviços Hospitalares (Ebserh).
Ethics committee approval: No. 5.888.374; No. 5.807.986.
Registration: Not applicable.

https://doi.org/10.1016/j.bjpt.2025.101334

72

ANALYSIS OF KNOWN-GROUP VALIDITY OF THE UPPER QUARTER Y BALANCE TEST FOR ASSESSING SWIMMING ATHLETES WITH SHOULDER PAIN

Gabriel Alves Dos Santos, Danyelle Leite Furtado de Araújo, Matheus Lemos Dos Santos, Marlison Douglas Nascimento Silva, Bruna Gabriella Nascimento Bezerra, Mayara Ribeiro da Silva, Valéria Mayaly Alves de Oliveira, Danilo Harudy Kamonseki
Departamento de Fisioterapia, Universidade Federal da Paraíba (UFPB), João Pessoa, PB, Brazil

Background: Upper extremity physical performance tests are widely used to assess the functional status of athletes, analyzing skills related to demands, including muscle strength, power, and agility. The Upper Quarter Y Balance Test (UQYBT) is commonly used for assessment of upper limb physical performance of the athletes. However, the information on the validity of the UQYBT in known groups of swimming athletes with and without shoulder pain is scarce. Therefore, further studies are needed to investigate the known group validity of the UQYBT in this population.
Objectives: To evaluate the known group validity of the UQYBT in swimmers with and without pain.
Methods: This is a cross-sectional study. This study was approved by Ethics Research Committee. Swimmers of both sexes, aged between 12 and 60 years, with at least one year of competitive swimming experience and a training regimen of at least twice a week, were included. The UQYBT was analyzed in its medial, superolateral, and inferolateral directions. The supporting hand was positioned at the center of the marking of the three lines, and the individual was asked to move the free limb as far as possible. The swimmers reached three times each direction and the mean and normalized by upper limb length were considered for analysis. To assess known-group validity, the scores of UQYBT were compared between athletes with shoulder pain and asymptomatic. The groups were chosen based on the assumption that shoulder pain would significantly affect physical performance measured by UQYBT, resulting in lower scores for athletes with shoulder pain. The Kolmogorov-Smirnov test was used to assess the distribution of the data. To compare the groups with and without pain, an independent samples t-test was conducted. Data analysis was performed using the Statistical Package for the Social Sciences, version 23.0 (SPSS Inc, Chicago, IL).
Results: A total of 51 athletes participated in the study. The asymptomatic group presented significant greater score than the shoulder pain group in the medial direction of the UQYBT (mean difference [MD]: 8,1, 95% CI: -14,22, -2,01 p = 0.013). For the superolateral and inferolateral directions, the asymptomatic group did not show a statistically significant difference compared to the shoulder pain group (MD = 5,43, 95% CI: -11,03, 0,15 p = 0.056) for superolateral directions and (MD = 0,70, 95% CI: -8,30, 6,89, p = 0.85) for inferolateral direction.
Conclusion: The findings indicated that performance in the medial direction of the UQYBT can identify differences between individuals with and without pain, however, for the superolateral and inferolateral directions did not show significant results to differentiate the groups.

Implications: The findings of this study suggest that performance in the medial direction of the UQYBT may be a valid indicator for distinguishing swimmers with and without shoulder pain, reinforcing its potential as a functional assessment tool for athletes in this sport. However, the superolateral and inferolateral directions may not be sensitive enough to detect performance deficits associated with shoulder pain.
Keywords: Physical Performance Test, Functional Test, Measurement Properties

Conflict of interest: The authors declare no conflict of interest.
Funding: Empresa Brasileira de Serviços Hospitalares (Ebserh).
Ethics committee approval: CAAE: 4.106.335/2020 e 3.741.115/2019.
Registration: Not applicable.

https://doi.org/10.1016/j.bjpt.2025.101335

73

DETERMINING KNOWN-GROUP VALIDITY OF THE UPPER LIMB ROTATION TEST IN SWIMMERS ASYMPTOMATIC AND WITH SHOULDER PAIN

Danyelle Leite Furtado de Araújo, Gabriel Alves Dos Santos, Matheus Lemos Dos Santos, Bruna Gabriella Nascimento Bezerra, Mayara Ribeiro Da Silva, Marlison Douglas Nascimento Silva, Valéria Mayaly Alves de Oliveira, Danilo Harudy Kamonseki
Departamento de Fisioterapia, Universidade Federal da Paraíba (UFPB), João Pessoa, PB, Brazil

Background: Swimmers frequently experience upper limb injuries, with shoulder pain being one of the most common, negatively affecting their athletic performance. Functional tests, such as the Upper Limb Rotation Test (ULRT), are widely used in clinical practice to assess these athletes. However, there is still no evidence to support the ULRT's ability to differentiate between asymptomatic swimmers and those with shoulder pain. Therefore, it is essential to investigate the known-group validity of the ULRT in this population.
Objectives: To evaluate the known-group validity of the Upper Limb Rotation Test in swimmers asymptomatic and with shoulder pain.
Methods: This is a cross-sectional study that includes swimmers of both sexes, aged between 12 and 60 years, with at least 1 year of competitive practice, and a minimum of two training sessions per week. This study was approved by Ethics Research Committee. The ULRT was performed with the swimmers in a modified flexion position (on their elbows), close to a wall. They performed trunk rotation and external shoulder rotation at 90° of abduction and external rotation, touching a tape on the wall as quickly as possible for 15 seconds. The athletes performed three trials, and the mean was considered for the analysis. The Shapiro-Wilk test was used to assess the normality of distributions for continuous data, which presented normal distribution. For the known group validity, the ULRT score of the asymptomatic group and those with shoulder pain was compared using an independent samples t-test. The data were analyzed with SPSS software version 23.0.
Results: A total of 50 athletes participated in the study, with 29 (58%) from the asymptomatic group and 21 (42%) from the group with shoulder pain, with a mean age of 30.46 ± 14.27 years, and 27 (54%) were male. For the validity of known groups, there was no statistically significant difference between the asymptomatic group and the group with pain (mean difference: 2.72, 95% CI: -5.87, 0.42, p = 0.08).
Conclusion: The results of this study indicate that the ULRT is unable to differentiate swimmers with shoulder pain from asymptomatic swimmers.
Implications: These findings can assist clinicians in the assessment and management of shoulder pain in swimmers, guiding the selection of more effective assessment tools to identify functional restrictions associated with shoulder pain in this population.
Keywords: Physical Performance Test, Functional Test, Measurement Properties

Conflict of interest: The authors declare no conflict of interest.
Funding: Empresa Brasileira de Serviços Hospitalares (Ebserh).
Ethics committee approval: CAAE: 82278824.8.0000.0017.
Registration: Not applicable.

https://doi.org/10.1016/j.bjpt.2025.101336

74

CORRELATION BETWEEN LUMBOPELVIC STABILITY TEST AND ENDURANCE TESTS OF THE TRUNK IN SWIMMERS

Matheus Lemos Dos Santos, Gabriel Alves Dos Santos, Raquel Lins de Sousa Lima, Bruna Gabriella Nascimento Bezerra, Mayara Ribeiro Da Silva, Marlison Douglas Nascimento Silva, Valéria Mayaly Alves de Oliveira, Danilo Harudy Kamonseki
Graduando em Fisioterapia, Departamento de Fisioterapia, Universidade Federal da Paraíba (UFPB), João Pessoa, PB, Brazil

Background: The pelvic drop can indicate a sign of muscle weakness during the lumbopelvic stability test. The integrity of this region ensures the proper transfer of energy to the distal segments for the body's kinematics and biomechanics, such as muscle strength, which is an important component of the kinetic chain. In swimming athletes, it is not yet clear which factors may be related to the injuries and pain they experience, making it necessary to understand if there is any correlation between the lumbopelvic stability test and trunk muscle endurance due to the scarcity of studies.
Objectives: To assess the correlation between the lumbopelvic stability test and endurance tests of the trunk in swimmers.
Methods: This was a cross-sectional observational study approved by the research ethics committee. The inclusion criteria were swimmers athletes of both sex, age between 18 and 60 years old, with competitive practice in the past one year, and regular training for at least twice a week. Lumbopelvic stability was assessed using the one-legged bridge test with spherical markers on the anterior superior iliac spines, where the pelvic tilt (in degrees) was observed and recorded. Two-dimensional analyses were conducted using the Kinovea 0.9.5 software (Kinovea Open Source Project) for Windows®. Additionally, muscle endurance of the trunk flexors (front plank), extensors (Biering-Sorenson test), and lateral flexors (side plank) was assessed by having the individual maintain a pre-established ideal posture for each muscle group for as long as possible. Pearson coefficient correlation was used to assess the association between the lumbopelvic stability test and endurance tests, which was classified as weak (0—0.39), moderate (0.40—0.69), and strong (0.70—1.00). Data analysis was performed using SPSS Inc, Chicago, IL version 23.0.
Results: A total of 27 athletes participated in the study, with mean age of 32.78 ± 14.64, 6.96 ± 6.05 years of sports practice, and 15 (56 %) were men. The results of the lumbopelvic stability test showed a weak negative correlation for the endurance of the flexor muscles (front plank) (r = - 0.233), right lateral flexors (side plank) (r = - 0.217), left lateral flexors (side plank) (r = - 0.003), and a weak positive correlation for the trunk extensor muscles (Biering-Sorenson test) (r = 0.109).
Conclusion: The lumbopelvic stability test has a weak negative correlation for the endurance of the flexor muscles, lateral flexors, and